

What is SEED?

SEED stands for the Study to Explore Early Development. It is a 5-year, multi-site collaborative study that will help identify what might put children at risk for autism spectrum disorders (ASDs) and other developmental disabilities. It is being conducted by six study sites and a data coordinating center called the Centers for Autism and Developmental Disabilities Research and Epidemiology (CADDRE) Network.

What are the six CADDRE centers?

The six CADDRE centers are:

- California CADDRE: Kaiser Permanente Division of Research and the California Department of Health Services
- Colorado CADDRE: Colorado Department of Public Health and Environment and the University of Colorado at Denver and Health Sciences Center
- Georgia CADDRE: the National Center on Birth Defects and Developmental Disabilities
- Maryland CADDRE: Johns Hopkins University and Kennedy Krieger Institute
- North Carolina CADDRE: University of North Carolina at Chapel Hill
- Pennsylvania CADDRE: University of Pennsylvania School of Nursing and The Children's Hospital of Pennsylvania

Where exactly is SEED being conducted?

California

a two county area: Alameda and Santa Clara counties

Colorado

the seven-county Denver metropolitan area: (Arapahoe, Adams, Boulder, Broomfield, Denver, Douglas, and Jefferson counties).

Georgia (CDC)

the five-county metropolitan Atlanta area: Clayton, Cobb, DeKalb, Fulton, and Gwinnett counties.

Maryland

seven jurisdictions in northeastern Maryland: Anne Arundel, Baltimore, Carroll, Cecil, Harford and Howard Counties and Baltimore City.

North Carolina

a ten county area: Alamance, Chatham, Davidson, Durham, Forsyth, Guilford, Johnston, Orange, Randolph, and Wake counties.

Pennsylvania

three counties: Chester, Montgomery and Philadelphia counties.

How were the sites selected?

The sites were originally picked through an open competitive review process in 2001 and funded for 5 years. The sites were selected based on the merit of their application. In 2006, CDC had a limited competitive review process and funded the sites for another 5 years.

How can I enroll my child into the study?

The study is a population based study – meaning that the participants will be recruited from all children and families in each study community who meet certain criteria rather than focusing on individuals at a specific clinic or school. Families of children with specific developmental conditions, as well as a random sample of all children born in the community will be invited to participate. If the invited family is interested, then we ask some questions to determine if they are eligible, and if they are eligible then the family is enrolled.

Can I sign my child up for this study?

Although families can self-refer to participate in this study, they have to fulfill certain criteria in order to be eligible. Some families who self refer may not be eligible. Our goal is to send letters of invitation to all families who may fulfill the eligibility criteria. By sending letters of invitation to as many eligible families as possible, we hope to enroll a representative sample of families in each study area.

Examples of the study eligibility criteria include - the child must be born within the study period, the child must be born and still living in the study area, they must have a legal guardian, they must know English or Spanish (although these vary by site), and they must also meet certain diagnostic criteria.

What will each study participant have to do?

Each parent or caregiver will have to answer questions about their child's development and their family's medical history. The study clinicians will perform a brief exam and developmental tests on the child. Each parent and child will have to give small samples of blood, cells from inside the mouth, and a sample of the child's hair. Finally, we would access the mother's and the child's medical records.

Why are we only looking at children in 6 states?

The funding for the study allowed us to support 6 study sites around the country.

Why are we only looking at children between the ages of 2-5?

The study will focus on children who are 2 to 5 years old. This age range was selected to reduce the amount of time since pregnancy and early development so that parent recall of events during these time periods is better, so that medical information is easier to retrieve, so that families are less likely to have moved away from the study area, and it will also be nearer the beginning of treatment for children in developmental intervention programs.

What is being investigated, and why?

- Physical and behavioral characteristics - Autism is a complex disorder and we want to better understand the full range of characteristics that are associated with autism. In this way, we may also better understand how the different causes of autism may be associated with specific subgroups of children within the autism spectrum.
- Infection and immune function, including autoimmunity – We want to follow up on reports that infections, or an abnormal response to infection – called the body’s immune response – may increase the risk for autism.
- Reproductive and hormonal features – We want to follow up on reports that abnormal hormone function – perhaps in the mother when she is trying to get pregnant, or later during pregnancy, or even later in the child after birth – may be associated with autism.
- Gastrointestinal features – We want to follow-up on reports that children with autism have abnormal gastrointestinal function, and whether it may be related to the causes of autism.
- Genetic features – Autism is a highly genetic disorder, but in particular we want to see if the genes that may be related to risk factors we are investigating – such as the genes that control immune function – are associated with autism.
- Socio-demographic features – We want to better understand the social, demographic, and economic features of families that are associated with having a child with autism.
- Smoking and alcohol use in pregnancy – Substance use in pregnancy can potentially harm the developing fetus and so we want to see if these so-called lifestyle factors are associated with autism.
- Sleep features – We want to follow-up on reports that children with autism have abnormal sleep patterns.
- Select mercury exposures - There are several studies, including studies funded by the government, looking at environmental exposures related to autism including mercury. CADDRE didn’t want to duplicate the work of these other studies, but we chose to look at information on vaccines and other types of medical procedures that may have mercury exposure that we can get through medical records.
- Occupational exposures - There are several studies, including studies funded by the government, looking at environmental exposures related to autism including mercury. CADDRE didn’t want to duplicate the work of these other studies, but we chose to ask parents to report to us about possible exposures they may have had at their jobs.

We selected these research factors after an extensive review of the literature. We designated each of the factors as high priority based on the how strongly they seemed to be associated with ASD and what new information we needed to collect about each factor, balanced by how well we could study each factor with our particular study methods.

What "selected mercury exposures" will be studied? How will they be studied? Why were these selected?

The mercury exposures we are looking at relate to vaccines or other medical treatments that are being studied include – vaccines that the mom received during pregnancy, the child's vaccine exposures after birth and specific other factors such as RhoGAM treatment in pregnancy if the mom has developed an immune response against the fetus that can harm it.

There are several studies, including studies funded by the government, looking at environmental exposures related to autism including mercury. SEED didn't want to duplicate the work of these other studies, but since we are getting medical records, we choose to look at information on vaccines and other types of medical procedures that may have mercury exposure that we can get through medical records.

Will the study include vaccines as a potential cause of autism?

Yes, the study will include vaccines. The mercury exposures being studied include – vaccines that the mom received during pregnancy, the child's vaccine exposures after birth and specific other factors such as RhoGAM treatment in pregnancy if the mom has developed an immune response against the fetus that can harm it.

There are several studies, including studies funded by the government, now looking at environmental exposures in autism such as mercury. SEED doesn't want to duplicate the work of these other studies, but since we are getting medical records, we choose to look at information on vaccines and other types of medical procedures that may have mercury exposure that we can get through medical records.

Will CDC find out if thimerosal causes autism?

It is too soon to speculate on the results of the study. We hope the study will give us a better idea of which of the risk factors that we will be looking at seem to be the most important in causing autism.

If the study shows that thimerosal is a cause of autism, will CDC report the data? What guarantees does the public have that the findings won't be covered up?

We will report all the findings of the study by following the normal scientific review process as soon as possible.

When the study is completed, will we know the causes of autism?

It is too soon to speculate on the results of the study. We hope the study will give us a better idea of which of the risk factors that we will be looking at seem to be the most important in causing autism. The causes may be related to genes, the environment, or a relationship between the two – such as if some groups of children with certain genes are more easily harmed by some environmental exposures.

Will this study find a prevention/cure for autism?

It is too soon to speculate on what we might find about the causes of autism. But, we are hopeful that the findings from SEED will help the development of future studies specifically designed to assess treatments among children with autism.

What are the other developmental disabilities being studied?

We will be studying a range of other developmental disabilities, including mental retardation, developmental delay, and other behavioral problems in early childhood.

Why are we looking at other developmental disabilities?

By comparing children with autism and children with other developmental disabilities we will try to see if the risk factors we observe in children with autism are unique to autism or if they are also important in children with other developmental problems. Looking at children with other developmental disabilities will also provide a way of comparing responses of children with developmental disabilities, in general, versus typically developing children.

How will you get the names of children to invite into the study?

We are working with our partners in the community who serve children with developmental problems and through these partners we will be sending out letters to families to invite them to participate.

Why didn't or doesn't the 2001/2002 funding represent "the first national study"?

In the initial grant awards (2001/2002), the grantees were responsible for 3 activities: setting up monitoring programs for autism and other developmental disorders, collaboration on the multi-site epidemiologic study, and investigator-initiated special studies. Although the multi-site study was planned, funding levels were not adequate to implement the multi-site study during the 2002/2002 funding cycle. Consequently, implementation was delayed until the current funding cycle. All funds awarded to the grantees in the current grant cycle are dedicated to implementation of the multi-site study. The grantees competed for funding to continue their monitoring activities under a separate grant announcement earlier in 2006, and no funding will be available for investigator-initiated special studies.

In what way(s) will the sample populations be representative of all children? It seems that by not including major states like New York, Illinois, Texas, etc. it's hard to claim this is "nationally representative"? Further, how will the selection/recruitment processes ensure or foster generalizability?

The two groups of children with ASD and other developmental problems will be identified in multiple clinical and educational facilities in each community to insure that the participants are representative of all children with these types of developmental problems - and not just children who might be seen at a single clinic or intervention program. The third group of study children will be randomly selected from all children born in each community during the same time period so that they are representative of all children in the study area most of whom do not have developmental problems.

Although resources do not permit the sample to be drawn so that it is statistically representative of all children in the nation, by conducting the study in 6 different geographic areas across the country with diverse populations and by identifying children from multiple sources in each community we hope to have a study sample that more closely represents children with ASD, other developmental problems, and typical development across the country.

Will there be interim results or will the study first have results six or so years from now?

Many of the core study hypotheses will require that we have data collection completed on the full study sample before analysis can take be completed, but some interim analyses that require less than the full study sample may be possible. We don't want to rush interim analyses, however, before we have a good representative sample of children.

What do you mean by "community diversity"?

SEED is located in select study areas within 6 states: 2 counties in the San Francisco, California area, 7 counties in the Denver, Colorado area, 5 counties in the Atlanta, Georgia area, 7 counties in the Baltimore and northeast Maryland area, 10 counties in central North Carolina, and 3 counties in the Philadelphia, Pennsylvania area. These study areas include diverse communities and populations from which study participants will be drawn.

Can this really be classified as a national study since it only involves six states?

It is a multi-site study set in diverse communities in 6 locations around the country: California, Colorado, Georgia, Maryland, North Carolina, and Pennsylvania.

Although resources do not permit the sample to be drawn so that it is statistically representative of all children in the nation, by conducting the study in 6 different geographic areas across the country with diverse populations and by identifying children from multiple sources in each community we hope to have a study sample that more closely represents children with ASD, other developmental problems, and typical development across the country.

How will this give us national insight?

Compared to a study located in a single area, our study in six different areas gives us geographic and community diversity that will give us greater insights into the variability of who is at risk and what are the risk factors for autism.

What is the methodology for collecting the data? Same for each state?

Yes, all the sites are using a common study protocol – meaning they are following the same procedures for recruiting participants and collecting data so that, at the end, the data from all 6 sites can be pooled into a single large data base for analysis.

We will be asking participants to complete self-administered questionnaires; interviewing mothers about pregnancy-related issues and developmental conditions in their children; conducting a developmental exam of each study child to evaluate cognitive and

emotional development, language and adaptive skills, and motor skills, and a dysmorphology exam of the child (that will look at physical features that may indicate an underlying genetic condition); taking cheek swab and blood samples from the mother; father, and child; taking a hair sample from the child; and looking at the mother and child's medical records.

Do all 2,700 of the children have an ASD?

No, there will be 900 children in each of 3 groups: children with ASDs, children with other developmental problems, and children drawn from the community most of whom are typically developing.

I live in one of the states with a CADDRE center. Who can I contact for more information about the study?

California CADDRE
Kaiser Permanente Division of Research
California Department of Health Services
Oakland, CA.
510.620.3700

Colorado CADDRE
Colorado Department of Public Health and Environment
University of Colorado at Denver and Health Sciences Center
Denver, CO
303.315.0066
303.692.2680

Georgia CADDRE
National Center on Birth Defects and Developmental Disabilities
Atlanta, GA
404.498.3800

Maryland CADDRE
Johns Hopkins University
Kennedy Krieger Institute
Baltimore, MD
877.868.8014

North Carolina CADDRE
University of North Carolina at Chapel Hill
Chapel Hill, NC
919.966.2068

Pennsylvania CADDRE
University of Pennsylvania School of Nursing
The Children's Hospital of Pennsylvania

Philadelphia, PA
215.573.2469
215.590.7474